# A critical appraisal of "Acute effect of scapular proprioceptive neuromuscular facilitation (PNF) techniques and classic exercises in adhesive capsulitis: a randomized controlled trial"

**By**

**Devin Glenn Graves, SPT**

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**Department of Physical Therapy**

**Angelo State University**

**Member, Texas Tech University System**

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**Abstract**

The ability to critically appraise research articles is essential for a doctoral physical therapy student aiming to use evidence based practice in the clinic. This appraisal evaluated a study that compared the immediate effects of scapular PNF techniques and classic exercises in patients with adhesive capsulitis. Each section of the article was systematically reviewed and the strengths and weaknesses were determined. Though the clinical implications of this article are minimal, it is a valuable contribution to the literature, as it prompts further investigation of the long term effects of scapular PNF techniques in patients with adhesive capsulitis.

**Key words: adhesive capsulitis, scapular PNF techniques, classic exercises**

## Introduction

Conservative treatments of adhesive capsulitis typically aim to decrease pain, while increasing shoulder range of motion (ROM) and functionality. Because the stability and motion of the scapula is essential for proper shoulder function, it is important to evaluate the scapula when treating patients with shoulder pathologies. Proprioceptive neuromuscular facilitation (PNF), thought to decrease pain and increase functionality, may be a potential tool for treating scapular alterations in patients with adhesive capsulitis. The purpose of this search was to determine if scapular PNF techniques are more effective than classic exercises in increasing shoulder range of motion.

## Methods

The databases used for the literature search process were Pub Med and CINAHL. The keywords used for the search were proprioceptive neuromuscular facilitation (PNF) and adhesive capsulitis. Limits were placed on the search to include only clinical trials and articles written in English. The purpose of limiting the search to return only clinical trials was to meet the requirements of the assignment for this course. The purpose of limiting the search to only articles written in English was to ensure I could comprehend the articles that were returned. Additionally, the Boolean operator “And” was utilized between the key words “PNF” and “adhesive capsulitis” in order to narrow the search to articles examining this specific intervention and the diagnosis of interest. The search returned two articles from Pub Med and four articles from CINAHL.

The article chosen for a comprehensive critical appraisal is from *The Journal of Physical Therapy Science*, which has an impact factor of 1.98. The study was published in 2016 and the authors include Nilay Comuk Balci, PT, PhD, Zeliha Ozlem Yuruk, PT, PhD, Aslican Zeybek, PT, MSc, Mustafa Gulsen, PT, PhD, and Mustafa Agah Tekindal, PhD. The study was conducted in Turkey, at the Baskent University Department of Physical Medicine and Rehabilitation outpatient clinic. I chose this article for critical appraisal because it best addressed my clinical question.

**Results**

Summary of the study

This study examined the immediate effects of two interventions on 53 patients with adhesive capsulitis. These interventions were scapular PNF techniques with modalities and classic exercises with modalities, with a control group receiving modalities alone. The outcomes assessed were pain, scapular dyskinesis, shoulder range of motion, and function. These outcomes were measured by the Visual Analog Scale, Scapular Slide Test, range of motion, and Simple Shoulder Test, respectively. Scapular PNF techniques with modalities and classic exercises with modalities both resulted in an increase in shoulder range of motion and function immediately. Also, Scapular PNF techniques with modalities and modalities alone both resulted in a decrease in pain immediately. However, none of the interventions had an effect on scapular dyskinesis. Furthermore, the article concludes that there were no statistically significant differences between the three groups.

Appraisal of the study introduction

The introduction successfully establishes the need for the study through a thorough literature review. There is an adequate description of the current approaches to the treatment of adhesive capsulitis, the role of the scapula in facilitating optimal shoulder function and the effects of PNF techniques in general. The authors' claims are supported with appropriate literature and they explicitly conclude that no previous study investigated the effects of scapular PNF techniques in adhesive capsulitis.

Though the diagnosis and intervention of interest are well addressed, overall the introduction is relatively brief and incomplete. The classic exercises being implemented and the outcome measures being evaluated are not explained. I believe that a description of these components and a rationale for using them, with the support of current literature, would make this introduction stronger. Additionally, there are no hypotheses stated and some sources were published more than ten years ago, so the information is potentially outdated.

Appraisal of the study methods

The methods section is well organized and provides enough detail to easily reproduce the procedure in the future. The study is a randomized control, prospective, cross-sectional design. Fifty-three subjects with similar sociodemographic, clinical and prognostic characteristics were recruited to participate. Three groups were employed in a between-subjects design and there was no attrition. The interventions are explained and the instruments for evaluating outcome measures are clearly described and supported with appropriate evidence.

The one weakness to the design of the study is that it is non-blind. Although the subjects' group assignments were concealed from the people enrolling individuals in the study, the

subjects were not masked to their group assignment. Furthermore, the clinician executing all interventions was aware of the group assignments, and it is not specified if the outcome assessor was blind to the group assignments

Appraisal of the study results

The results section is also written in a clear and organized manner. The results are presented in the same order as the the procedures are presented and all outcome measures are reported. The figures are presented clearly, accurately and make sense. There were significant differences in VAS results in the PNF and control groups but not in the classic exercise group. There were also significant improvements in shoulder ROM in all groups reported. No notable weaknesses were identified.

Appraisal of the study discussion

The authors do a great job tying the results into the existing literature regarding shoulder function and adhesive capsulitis. Even though there were no significant differences between the immediate effects of any groups, the value of comparing the long term effects of these interventions was established. The authors acknowledge the limitations of the study and conclude that therapies targeting scapular function should be included in an effective treatment regimen for shoulder rehabilitation.

The limitations to this study are important to highlight. The study only examines the immediate effects of the interventions, which does not indicate long term or sustained effects. Also, only flexion and abduction ROM were considered in the study and the authors state that internal and external rotation deficits are more common in adhesive capsulitis. However, these

limitations are recognized by the authors.

**Discussion**

This study addresses my clinical question because it compares PNF techniques with classic exercises in increasing shoulder range of motion in patients with adhesive capsulitis. The clinical significance of exploring this question is seeking the more effective approach in treating patients with adhesive capsulitis. This has implications for clinical decision making and providing the most effective care for patients with adhesive capsulitis. Though this study did not find any statistically significant differences between the immediate effects of the treatment groups, perhaps it prompts further investigation about the long term effects of such interventions on adhesive capsulitis.

Based on the article, utilizing scapular PNF techniques with physiotherapy modalities is one viable option for generating immediate improvements in patients with adhesive capsulitis. This combination produced a statistically significant improvement in pain, as well as shoulder flexion and abduction ROM in these patients. The conclusion that cannot be made from this study is that scapular PNF techniques have a greater immediate impact on patients with adhesive capsulitis than classic exercises. A long-term study examining the effects of these interventions on shoulder function and ROM could potentially provide more insight to which intervention is more advantageous.

I can anticipate using some combination of scapular PNF techniques and classic exercises with physiotherapy modalities on patients with adhesive capsulitis to improve shoulder ROM

and functionality. Though some results are not statistically significant, all three interventions produced a positive effect on all outcome measures assessed. Furthermore, the sources cited within the article further support the efficacy of classic exercises, PNF and physiotherapy modalities on shoulder function in general. However, this is most likely not an article I would reference as evidence for the treatment of a future patient because there are limitations to the study design and the results are not outstanding.

This study has strengths and weaknesses, but overall it is a valuable contribution to the literature as the first study to examine the immediate effects of scapular PNF techniques in adhesive capsulitis. No statistically significant evidence indicating that scapular PNF techniques are more beneficial than classic exercises was found. The results prompt further investigation of the long term effects of these treatment approaches on shoulder pain, ROM and functionality.

**Reference**

Balcı, N. C., Yuruk, Z. O., Zeybek, A., Gulsen, M., & Tekindal, M. A. (2016). Acute effect of scapular proprioceptive neuromuscular facilitation (PNF) techniques and classic exercises in adhesive capsulitis: A randomized controlled trial. *Journal of Physical Therapy Science*, 28(4), 1219-1227. doi:10.1589/jpts.28.1219